

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
19 May 2005 (19.05.2005)

PCT

(10) International Publication Number
WO 2005/046037 A1

(51) International Patent Classification⁷: H02M 3/337
(21) International Application Number:
PCT/DK2004/000740

(22) International Filing Date: 27 October 2004 (27.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
03025509.5 6 November 2003 (06.11.2003) EP

(71) Applicant (for all designated States except US): BANG & OLUFSEN A/S [DK/DK]; Peter Bangs Vej 15, DK-7600 Struer (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): NIELSEN, Runo [DK/DK]; Kildebjerggård 3, DK-5690 Tommerup (DK). CHRISTENSEN, Søren, Kjærulff [DK/DK]; Pilevej 41, DK-7600 Struer (DK).

(74) Agent: PATRADE A/S; Fredens Torv 3A, DK-8000 Aarhus C (DK).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

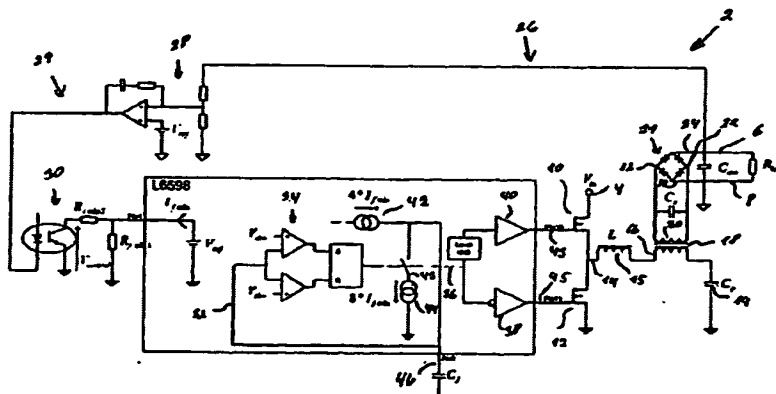
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CHARGE MODE CONTROL OF A SERIAL RESONANCE CONVERTER



(57) Abstract: The present invention relates to an apparatus and a method for converting power from a power input to a DC output current or voltage, where a first feedback circuit is a traditional feedback. The converter type is a resonant DC-DC converter. The scope of the invention is to reach a high effective and fast responding switch mode power supply. This can be achieved with an apparatus or method comprising a second feedback circuit leading a signal from a serial resonance capacitor(s) to a reference input terminal at the control circuit, which second feedback circuit contains a signal depending on the actual change in charge of the resonant capacitor(s). This means that at high load, a very powerful signal will be transmitted through the second feedback at the control circuit that will change the operation of the circuit into a charge mode operation. As the load on the output is reduced the influence of the second feedback signal will be reduced, and the influence from the charge mode is reduced and the operation mode is changing back into a normal frequency mode of operation. In this way, a much more constant gain in the series or series parallel resonant DC-DC converter is achieved, and therefore a much better regulated voltage or current of the resonant DC-DC converter can be made.

WO 2005/046037 A1